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ABSTRACT

A sample of 174 eleventh-grade students divided two passages into idea units (segments of information used when reading) and rated predetermined idea units according to three attributes that have been shown to correlate with recall. Standardized test scores for reading, scholastic aptitude, and general achievement were included in the analyses. Results of regression analyses and t-tests of differences between good and poor readers indicated that the distinctive skills of fluent reading do not involve the identification of idea units or the discrimination of idea-unit interest, importance, or concreteness. Correlations between standardized test scores and reading are also discussed. (Author/AA)

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Processing of Prose by Good and Poor Readers

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Abstract

High school students divided two passages into idea units (segments of information used when reading) and rated idea units of judges according to three attributes which have been shown to correlate with recall. Standardized test scores for reading, scholastic aptitude, and general achievement were included in the analyses. Results of regression analyses and t-tests indicated that the distinctive skills of fluent reading do not involve the identification of idea units or the discrimination of levels of idea unit interest, importance, or concreteness. Interesting correlations between standardized test scores and reading were noted.

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Our general research interest is the identification of processes which distinguish fluent reading from nonfluent reading. Three types of reading process which we investigated were the identification of idea units, the discrimination of levels of interest, importance, and concreteness among idea units, and readers' use of general cognitive skills.

For the first area of investigation readers identified idea units, which are defined throughout this study as units of information which one uses when reading. Earlier research with eye movements suggested that good readers use larger units than poor readers; that is, better readers have longer saccades (Gibson and Levin, 1975), faster readers have longer eye-voice spans (the distance the eye is ahead of the voice) (Morton, 1964; Levin and Kaplan, 1970), and older readers tend to have longer eye-voice spans (Tinker, 1958). Better readers (Schlesinger, 1968) and older readers (Levin and Kaplan, 1970) are not more likely to end eye-voice spans at the boundaries of phrases, which might be processing units for readers (Levin and Kaplan, 1970). Faster readers, however, were more likely than slower readers to end eye-voice spans at phrase boundaries. With this background, we explored these research questions. Do good and poor readers divide prose into a different number of idea units; i.e., do they use different sized units? How much agreement is there on the number of idea units among good readers and among poor readers? How well do the boundaries of idea units chosen by good and poor readers agree with the divisions made by independent judges? Are differences in these variables related to differences in recall?

The second area of investigation concerned readers' ability to discriminate levels of interest, importance, and concreteness among idea units. Previous work has shown that differential recall within a prose passage can be predicted by the levels of such attributes of the idea units (Johnson, 1970, 1973, 1974; Meyer and McConkie, 1973). Because good and poor readers differ in recall, and recall is predictable from attributes of idea units, then differences in ability to discriminate such attributes may account for differences in recall.

The third area we investigated was the use by good and poor readers of the general skills represented in standardized tests of reading, total achievement, and school aptitude. Our interest was not to study whether good readers have higher total achievement and school aptitude, which has already been documented, but to determine whether good readers use their skills differently or more effectively than poor readers. Any differences in the use of good and poor readers' cognitive skills should be reflected in the pattern of correlations between recall and the test scores. As an illustration, if good readers relied strongly on skills measured by a standardized reading test and poor readers relied strongly on the skills measured by a scholastic aptitude test, then good readers' recall would correlate strongly with reading test scores and not with aptitude test scores, while the opposite would be found for poor readers.

Method

The experimenters conducted the study in 11th grade English classes in a Connecticut metropolitan parochial school. There were 174 students with complete data sets who were included in the analyses.

Students were randomly given one of two passages to read. Passage 1, "Room for One More," was a simple folktale (sixth grade reading level). Passage 2, "The Therapeutic Community," was a more complex article about a method of group therapy (college reading level). The first passage had been used in research by Johnson (1970) and the second by Meyer (1973). After reading the passage, the students were asked to write down as much as they could remember. They were then asked to return to the original passage and quickly divide it into idea units.

Undergraduate judges at Trinity College had also divided the passages into idea units. Passage 1, "Room," had 49 idea units, and Passage 2, "Community," had 60. The experimenters returned to the high school within a week after the first visit and asked the high school students to rate, on a 7-point scale, the interest, importance, and concreteness of the judges' idea units. Each student was randomly assigned to rate one of the three dimensions for both passages. Correlations were calculated between the mean ratings and mean recall of each idea unit.

Scores from SRA tests of reading, scholastic achievement, and scholastic aptitude were available for the students. Good readers were defined by scores above the median and poor readers by scores below the median of all participants who had taken the SRA reading test. The readers at the median were assigned to either the good or poor group. For good readers the average reading grade equivalent was 11.5, school aptitude was 121.9, and total achievement grade equivalent was 10.7. For poor readers, reading was 8.0, aptitude was 107.6, and total achievement was 8.0. Passage 1 was recalled by 44 good readers and by 44 poor readers. Passage 2 was recalled by 45 good readers and 41 poor readers. Correlations were calculated between the test scores and recall for each reader.

Results

For the first area of study, readers identified their own idea units. For each passage there was no significant difference between good and poor readers in the mean or standard deviation of the number of units identified. There were also no significant differences between good and poor readers in the percent agreement with the judges' division of each passage into idea units. Table 1 gives the figures.

For the second area of study, readers' recall and ability to discriminate levels of interest, importance, and concreteness were measured. Good readers did recall significantly more of each passage than poor readers (see Table 2); for Passage 1, $\underline{t} = 1.66$, $\underline{p} < .05$, one-tailed, and for Passage 2, $\underline{t} = 4.16$, $\underline{p} < .0005$, one-tailed. There were, however, no significant differences in good and poor readers' means and distributions of ratings for interest, for importance, and for concreteness (see Table 3). It is noteworthy that both good and poor readers on both passages rated idea units highest in importance and lowest in concreteness, with interest being intermediate.

Table 1

Number of Readers' Idea Units and Agreement with Judges' Units

	Passage 1, "Room"				Passage 2, "Community"			
	Number		% Agreement		Number		% Agreement	
Readers	mean	s.d.	mean	s.d.	mean	s.d.	mean	s.d.
Good	54.3	20.9	74.6	3.6	79.0	34.7	78.8	6.5
Poor	51.4	19.3	74.8	3.1	73.9	29.5	79.7	5.4

Table 2

Recall

	Passage 1, "Room"			Passage 2, "Community"		
Readers	percent	s.d.	n	percent	s.d.	n
Good	50.7	10.3	44	19.0	9.4	45
Poor	47.0	10.7	44	12.1	5.3	41

Note: Passage 1 had 49 idea units, Passage 2 had 60.

Table 3

Ratings of Idea Unit Dimensions

		Interest		Importance		Concreteness	
Passage	Readers	mean	s.d.	mean	s.d.	mean	s.d.
1, "Room"	Good	3.83	.89	4.58	1.07	3.66	.92
	Poor	3.92	.98	4.72	.99	3.67	.93
2, "Community"	Good	3.93	.85	4.70	1.02	3.74	.89
	Poor	4.02	.94	4.76	.91	3.74	.88

Tables 4 and 5 contain separate correlation matricies of the three attributes and recall for good and poor readers on each passage. The correlations were calculated between the average dimension ratings and the average recall for each idea unit. For both passages, the correlations for good and poor readers were similar. For Passage 1, "Room," none of the dimensions were significantly related to recall. On the more difficult passage, "Community," both interest and importance are significantly correlated with recall for both good and poor readers.

Step-wise regressions, in which the three dimensions were the independent variables and recall the dependent variable, identified no variables for the "Room" passage which were significant at the .05 level. According to a step-wise regression analysis of the "Community" passage, interest was a significant variable for good readers, $t=2.33$, $p < .03$, although it accounts for only 9% of the variance in their recall. In contrast, for poor readers, importance was a significant variable, $t=3.26$, $p < .002$, accounting for 16% of the variance in recall.

Tables 6 and 7 summarize the results of the third area of study, concerning the relationship between standardized test scores and recall. As expected, the three scores were interrelated for good and poor readers on both passages. For Passage 1, "Room," none of the standardized test scores were correlated with recall for good readers; however, reading scores were significantly correlated with recall for poor readers. For Passage 2, "Community," several changes in the correlations were apparent. Reading, aptitude, and general achievement scores were strongly related to recall for both good and poor readers.

Step-wise regressions for each passage were calculated, with recall as the dependent variable and with reading, aptitude, and achievement scores, and number of reader's idea units and agreement as the independent variables. For Passage 1, "Room," no variables were significant at the .05 level for good readers, but reading scores were significant for poor readers, $t=2.52$, $p < .02$, accounting for 13% of the variance. For Passage 2, "Community," reading and general achievement scores were significant for good readers, $t=2.59$, $p < .02$, and $t=2.15$, $p < .04$, respectively, accounting for a total of 47% of the variance; poor readers' recall was significantly predicted by aptitude scores, $t=4.33$, $p < .001$, accounting for 33% of the variance.

Discussion

Good and poor readers were surprisingly similar in these analyses, except, as expected, in terms of total recall.

When asked to identify their own idea units, good and poor readers identified the same number of units and agreed equally well with the idea units chosen by independent judges. In addition, the variances for the number and agreement of idea units indicated that there was no greater consensus among good readers than among poor readers. In other words, there was no evidence that good readers used larger units than poor readers or that the units chosen by good readers were more predictable than those chosen by poor readers. There was no significant relationship between recall and number of units or agreement with the judges.

Other researchers have found correlations between recall and the interest, importance, and concreteness of idea units. Because good readers do recall more than poor readers, it was expected that good readers would prove to be better able

Table 4

Correlations Between Mean Ratings and Mean Recall of Idea Units in Passage 1, "Room"

		1	2	3	4
1.	interest		.792*	.019	.088
2.	importance	.878*		-.190	.100
3.	concreteness	-.069	-.188		.028
4.	recall	-.030	.054	-.040	

Note: Correlations for good readers are above the diagonal and for poor readers are below the diagonal. n = 49 idea units.

*p <.01

Table 5

Correlations Between Mean Ratings and Mean Recall of Idea Units in Passage 2, "Community"

		1	2	3	4
1.	interest		.785**	.045	.293*
2.	importance	.862**		-.136	.289*
3.	concreteness	-.016	-.154		-.111
4.	recall	.379**	.394**	-.194	

Note: Correlations for good readers are above the diagonal and for poor readers are below the diagonal. n = 60 idea units.

*p <.05
**p <.01

Table 6

Correlations for Readers of Passage 1, "Room"

		1	2	3	4	5	6
1.	reading score		.687**	.755**	-.104	.111	.111
2.	aptitude score	.536**		.661**	.027	.059	.153
3.	achievement score	.601**	.605**		.027	-.017	.233
4.	number of ideas	-.117	-.056	-.168		-.564**	-.045
5.	agreement	.022	.006	.217	-.568**		.089
6.	recall	.362*	.255	.290	.203	.011	

Note: Correlations for good readers (n=44) are above the diagonal and for poor readers (n=44) are below the diagonal.

*p <.05
**p <.01

Table 7

Correlations for Readers of Passage 2, "Community"

		1	2	3	4	5	6
1.	reading score		.540**	.692**	.016	-.015	.638**
2.	aptitude score	.435**		.845**	.316*	-.289	.533**
3.	achievement score	.511**	.684**		.352*	-.336*	.617**
4.	number of ideas	-.243	-.158	-.014		-.979**	.057
5.	agreement	.293	.161	.083	-.964**		-.041
6.	recall	.471**	.570**	.529**	-.195	.204	

Note: Correlations for good readers (n=45) are above the diagonal and for poor readers (n=41) are below the diagonal.

*p <.05
**p <.01

to discriminate levels of such attributes. Nevertheless, good and poor readers were indistinguishable in their ratings of the idea units. There was no evidence from the means or standard deviations that good readers were more sensitive to such attributes of prose. The correlations between the recall and ratings of idea units were very similar for good and poor readers. Regression analyses for both passages indicated that for Passage 2, "Community," interest was a significant variable for good readers, while importance was a significant variable for poor readers. However, this difference is not unambiguous, due to the high correlation between interest and importance for good and poor readers.

Correlations between recall and standardized test scores were relatively similar for good and poor readers. For Passage 1, "Room," the correlations were all less than .37; the only significant correlation was between reading scores and recall for poor readers. Regression analyses confirmed that poor readers' reading scores comprised the only significant variable. For Passage 2, "Community," all the correlations fell between .47 and .64 and all were statistically significant. Nevertheless, regression analyses identified only scholastic aptitude as a significant variable for poor readers of Passage 2 and reading and general achievement for good readers of Passage 2. Note that good and poor readers rely on the skills tapped by the reading test when the reading task is more appropriate to the readers' level. When the task is too difficult, poor readers rely on the skills represented by the aptitude test. The fact that good readers of Passage 2 relied not only on reading ability, but also on general achievement, may indicate a difference between good and poor readers that does not directly involve cognitive processes; that is, part of what makes a student a good reader rather than a poor reader is having more general knowledge.

The results suggest that the cognitive processes which make some readers better than others do not involve the identification of idea units or the discrimination of levels of idea unit interest, importance, or concreteness. If good readers do use cognitive processes that are different from those used by poor readers, these skills are not clearly among those measured by the standardized tests used in this research.

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